

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

Western Seams Coordination	)	Docket No. AD26-10-000
	)	
	)	

**JOINT REPORT OF
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
AND SOUTHWEST POWER POOL, INC.**

The California Independent System Operator Corporation (CAISO) and Southwest Power Pool, Inc. (SPP) submit this joint report in response to the Commission’s July 16, 2026, order in this proceeding. The objectives identified in this report support coordinated operations between and among CAISO, SPP, and affected entities in the West. The parties request that the Commission accept this report in compliance with its order in this proceeding.¹

I. Introduction

Together, SPP and CAISO have extensive experience providing reliability and market services, with each having an established history of collaboration and coordination within the wholesale electricity industry.² Specifically, SPP and CAISO have engaged with (1) each other; (2) affected balancing authority participants; (3) non-participant balancing authorities; (4) transmission service providers; and (5) transmission operators to support market development in the West and are committed to working towards the

¹ *Western Seams Coordination*, 196 FERC ¶ 61,032 (2026) (directing a joint report pursuant to sections 304 and 309 of the Federal Power Act, 16 U.S.C. §§ 825c, 825h) (hereinafter the “July 16 Order”). CAISO and SPP collectively refer to their organizations in this report as the parties.

² SPP also has comprehensive experience managing market seams in the Eastern Interconnection.

goals described in the July 16 Order. Ongoing good faith pursuit of the objectives identified in this report, combined with existing practices, will support coordinated and reliable operation of the Western Interconnection under the current Commission-approved rules for Markets+, the Extended Day-Ahead Market (EDAM) and SPP's expanded Regional Transmission Organization (RTO) footprint.³

CAISO and SPP recognize expectations for seams coordination in the West are high. Consideration of identified issues beyond the horizon of the parties' near-term objectives will continue through further collaboration with stakeholders, coordination with each other and among affected entities, and ultimately authorization by the parties' respective governing bodies following their individual stakeholder processes as appropriate.

The July 16 Order recognizes the complexities presented by market development in the West because consolidation of the balancing authority, transmission service provider, and transmission operator functions are not required within the EDAM, WEIM, or Markets+ footprints.⁴ Accordingly, balancing the continued autonomy of participating entities with seams coordination arrangements is essential,⁵ particularly as these markets

³ This report applies to all three markets and makes distinctions where applicable, particularly where SPP's expanded RTO is involved because of its integrated functions that support seams coordination. Also, EDAM is a day-ahead market only and relies upon the Western Energy Imbalance Market (WEIM) as the real-time market, while Markets+ integrates the day-ahead market and real-time markets into a single service. This report applies to both EDAM and WEIM unless otherwise specified because balancing authorities may continue participation in the WEIM only. Finally, this report assumes that a non-market balancing authority does not participate in any of the markets covered by this report.

⁴ July 16 Order at P 6; see also Western Resource Advocates and Grid Strategies, *Managing Seams – Market Coordination in the Western Wholesale Energy Markets*, August 2025, pp. 5-7.

⁵ July 16 Order at P 4.

continue to develop. SPP and CAISO are uniquely positioned to facilitate consensus as work on these issues with stakeholders across the West continues.⁶

This response to the July 16 Order provides a solid start for coordination of seams and markets in the West and lays a foundation for consideration of future measures. In the meantime, CAISO and SPP will continue their collaboration on the more immediate objectives that this report describes.

II. Summary of Objectives

Seams coordination in the West will build upon existing processes, practices, procedures, frameworks, and agreements for data exchange, system modeling, and operational planning. The parties have identified six near-term objectives they will pursue, while acknowledging that seams coordination efforts and consideration of additional measures extend beyond the timeframe for implementation of these objectives. The objectives identified below are underway and will be completed before or shortly after the implementation of Markets+ in October 2027. They include:

- Enhancing education and training on market protocols through joint market seams workshops, individual market operator training of market participants and joint educational efforts.
- Enhancing data sharing to improve the frequency, granularity, timeliness, and quality of shared information.
- Maintaining enhanced full network model alignment and a common mapping standard.
- Implementing the Western Interconnection Loading Relief process and Enhanced Curtailment Calculator through the applicable North American Standards Board (NAESB) process.
- Developing a framework for jointly impacted constraint management in conjunction with entities responsible for operation and transmission service that identifies key

⁶ *Id.* at P 11.

constraints, aligns relevant model and operating-limit information, determines each affected area's relief obligation, and allows each market operator to provide the required relief through its own dispatch processes.

- Planning for longer-term market-to-market enhancements in collaboration with stakeholders based upon operational experience.

The parties' detailed responses to the Commission's questions further describe the existing practices, procedures, frameworks, and agreements that form the basis of seams coordination in the West. The response to these questions also summarizes the status of efforts undertaken to date, identifies specific seams and market coordination issues, establishes a plan and schedule for addressing some of the identified issues, and confirms the parties' alignment on the path forward.

III. Response to Seams and Market Coordination Questions

The July 16 Order directs CAISO and SPP to respond to the following questions. Below is the parties' joint report, shared objectives, and commitments in response to the Commission's questions.

Question 1

What efforts have CAISO and SPP undertaken to date on seams and market coordination? Which other entities (e.g., market participants, adjoining BAAs that have not enrolled in a day-ahead market, etc.) have CAISO and SPP engaged in discussions on these issues?

Response

Efforts on seams and market coordination in the Western Interconnection began well before the July 16 Order. They developed alongside SPP-CAISO expansion of reliability coordination, SPP's RTO services, WEIM, EDAM, WEIS, and Markets+. Both market operators recognize that seams coordination involves more than market operators

alone; it requires engagement with Reliability Coordinators, Balancing Authorities, Transmission Operators (TOP), Transmission Owners, Transmission Service Providers, transmission customers, and market participants whose systems, transmission rights, or commercial transactions may be affected by multiple market footprints.

To support these needs, SPP and CAISO have pursued seams coordination through multiple forums joint activities, stakeholder structures, Reliability Coordinator processes, and bilateral and multilateral engagement – all guided by the applicable reliability standards, operating procedures, tariffs, protocols, business practices, principles under consideration, and various existing agreements.

A. SPP-Led Efforts

SPP established the Markets+ Seams Working Group (“MSWG”)⁷ early in the development of Markets+ to guide coordination between Markets+ and neighboring transmission systems, Balancing Authority Areas, and other organized markets. The MSWG began formal meetings in 2023 and was charged with providing direction and guidance on potential seams agreements, joint market operating arrangements, and other coordination mechanisms involving neighboring transmission providers, market operators, transmission owners, Reliability Coordinators, and customers.

MSWG workstreams have included market design of import and export interchange transactions (including determination of transaction priority), wheel-through

⁷ The MSWG is comprised of at least nine (9) and no more than twenty-four (24) Markets+ Market Participant and Markets+ Market Stakeholder representatives, including a chair and vice-chair. The MSWG maintains a balance of one-third investor-owned utilities, one-third public power entities, and one-third independent entities, provided enough entities are participating in each sector to maintain this balance. See *Organization Group Scope Statement*, available at [https://www.spp.org/documents/69067/marketsplus%20seams%20working%20group%20\(mswg\)%20scope%20statement.pdf](https://www.spp.org/documents/69067/marketsplus%20seams%20working%20group%20(mswg)%20scope%20statement.pdf).

transactions, interchange pricing and transfers between markets, tagging and scheduling requirements, and potential market-to-market coordination.

At the direction of the Markets+ Participant Executive Committee (“MPEC”), the MSWG also developed the Markets+ Seams Strategy and Roadmap,⁸ including milestones for future seams policy development.⁹ SPP supplemented this work with recurring stakeholder engagement through both the MSWG and SPP’s Seams Advisory Group (“SAG”).¹⁰

These public forums allow SPP, stakeholders, and other Western entities to identify seams issues during Markets+ implementation and distinguish issues that are resolvable through education and operating practices from issues requiring tariff or protocol revisions or formal coordination arrangements. SPP is also in the process of developing coordination agreements and Energy Emergency agreements with other Western entities whose transmission systems or balancing authority functions may sit between, border, or otherwise be affected by the emerging market footprints.

⁸ Available at https://www.westernenergyboard.org/wp-content/uploads/Markets-Seams-Strategy-and-Roadmap_MPEC-approved.pdf.

⁹ FERC staff specifically recognized the MSWG as one of the principal Western seams coordination efforts already underway and noted that CAISO, balancing authorities associated with both Markets+ and EDAM, trade groups, and public-interest organizations have participated in its discussions. Federal Energy Regulatory Commission Staff, *Seams Coordination in the Western Interconnection* (Nov. 21, 2025), available at <https://www.ferc.gov/sites/default/files/2025-11/Seams%20White%20Paper%202025-11.pdf>.

¹⁰ This includes monthly seams coordination discussions through the MSWG and the Seams Advisory Group (“SAG”). Pursuant to its Scope Statement, the SAG “is responsible for providing direction, guidance, and advice to Southwest Power Pool (SPP) Organizational Groups, advisory groups, user forums, and staff regarding issues impacting or being impacted by SPP’s seams agreements, joint operating agreements, or arrangements with neighboring transmission providers, transmission owners, or customers....” A copy of the scope statement, as well as all meeting materials relating to the SAG, is publicly available on SPP’s website.

B. CAISO-Led Efforts

CAISO has been operating the WEIM across multiple balancing areas for more than a decade. In that context, participants and CAISO have been continuously engaged and addressing seams issues. For example, stakeholders desired a mechanism to access emergency energy through the market if a Balancing Authority anticipates a shortfall towards meeting its resource sufficiency obligation. The solution provides balancing authorities the option to elect to receive assistance energy transfers from other participating Balancing Authorities prior to the market.¹¹ In addition, CAISO and the Bonneville Power Administration (BPA) executed the Coordinated Transmission Agreement after a few years of WEIM operation.¹² This agreement supports reliable and efficient operation of the BPA transmission system by providing certain market data and information to BPA, which BPA uses to determine the transmission limits that it will enforce and that CAISO in return respects in the market. Collectively these efforts have been part of the groundwork for CAISO seams management in EDAM.

In its role as Reliability Coordinator, CAISO has engaged directly with individual Balancing Authorities and groups of Balancing Authorities on a variety of seams and market coordination topics. One example is the Portland area coordination discussions involving BPA, Portland General Electric (PGE), and PacifiCorp. These discussions began prior to PacifiCorp's participation in EDAM and were designed to identify opportunities for coordination of jointly impacted transmission elements in the Portland

¹¹ CAISO Tariff, Section 29.34(n)(3).

¹² *Cal. Indep. Sys. Operator Corp.*, Commission Letter Order, Docket No. ER17-1493- 000 (June 20, 2017). Information regarding the Coordinated Transmission Agreement is available on the BPA website at <https://www.bpa.gov/energy-and-services/transmission/coordinated-transmission-agreement>.

area. The coordination has continued through preparations for PGE's implementation into EDAM on October 1, 2026, and has provided a forum for developing a shared understanding of the operational and transmission management issues associated with this market expansion.

C. CAISO-SPP Joint Efforts

Initial seams and market coordination between CAISO and SPP began in Q3 of 2023 and evolved to a more structured seams coordination process beginning in summer 2025. Executive-level meetings (held quarterly) and staff discussions (held bi-weekly) focus on identifying and addressing seams issues across operational and commercial interfaces.

Throughout 2026, SPP and CAISO staff continued market-design discussions and subject-matter-expert sessions, moving beyond high-level identification of seams issues and evaluating specific operational and commercial scenarios. These discussions have addressed, among other matters, transmission rights and service structures; imports, exports, and wheel-through transactions; intertie and interface price formation; market timelines and tagging requirements; transmission opt-in and opt-out processes; constraint activation and congestion management; loop-flow impacts; and the interaction between market processes and reliability tools. The executive meetings continue approximately quarterly while staff discussions recur biweekly and will continue for the foreseeable future. Throughout this period, SPP-CAISO staff have actively monitored each other's activities, public workshops, and regulatory filings to remain informed of market developments with potential implications for regional coordination.

Public workshops in 2026 (February SPP Seams Symposium, CAISO July workshop, SPP and CAISO joint workshops in August and September with another scheduled in October) enabled detailed walkthroughs of Markets+ and EDAM/WEIM constructs by subject matter experts using common operational and commercial scenarios. These workshops helped to develop a shared understanding of how each market represents transmission rights, schedules, market transfers, constraints, and prices and, from that comparison, identify seams considerations arising from differing rules, timing, data, or operational practices.

SPP and CAISO have also collaborated on several initiatives with specific Western entities where market or reliability transitions create direct seams considerations. This has included work involving improved seams coordination procedures with PacifiCorp, which necessitated coordination among SPP in its Balancing Authority and Reliability Coordinator roles, CAISO as a Reliability Coordinator and the WEIM market operator, and PacifiCorp as the affected Balancing Authority and Transmission Operator.

Through this collaboration, CAISO and SPP have progressed from general issue identification towards development of the specific coordination mechanisms SPP-CAISO commit to in this report. For example, subsequent SPP-CAISO discussions have identified the need for improved forward data and model coordination, reciprocal awareness of transmission constraints impacted by SPP or CAISO operated markets, coordination of operating plans for known congestion areas, and improved visibility of transfers that cross an adjacent market footprint. SPP and CAISO have also been evaluating with each other how existing Reliability Coordinator, Balancing Authority, and Transmission Operator processes can be supplemented by market advisory run

information so that potential congestion and reliability impacts are identified earlier in the operating horizon rather than addressed solely through real-time corrective actions.

The collective seams coordination process has intentionally remained broad because many of the relevant issues—particularly transmission availability, interchange scheduling, loop flow, congestion relief, and emergency operations—cannot be resolved solely through an agreement between the two market operators.¹³ Accordingly, both organizations have engaged stakeholders through their respective roles and broader regional outreach efforts. Future revisions that may need to be reflected in the CAISO and SPP tariff would ultimately go through the parties' respective stakeholder and governing body approval processes prior to being filed with FERC for acceptance.¹⁴

D. Reliability Coordinator Collaboration

A major related element of seams coordination occurs through Reliability Coordinator responsibilities and the Western Interconnection Unscheduled Flow Mitigation Plan. SPP currently administers that plan and the Enhanced Curtailment Calculator Working Group (ECCWG) stakeholder process, while CAISO maintains the network model used by Reliability Coordinators in the Western Interconnection and the vendor management for the Enhanced Curtailment Calculator (ECC) tool itself.

SPP's RC and CAISO's RC West jointly advanced a proposal through the NAESB to expand the use of the Enhanced Curtailment Calculator (ECC) tool beyond the existing

¹³ For example, SPP is in the process of developing coordination agreements and energy emergency agreements with other Western entities whose transmission systems or Balancing Authority functions may sit between, border, or otherwise be affected by their emerging market footprints. Similarly, CAISO received several seams-related stakeholder proposals and prioritized them alongside other market design initiatives under consideration as part of its Spring 2026 Roadmap and Stakeholder Catalog process.

¹⁴ Participating entities may also need to go through their respective stakeholder and approval processes depending on the associated revisions to their practices, procedures and tariffs.

Qualified Transfer Paths and establish a more standardized, flow-based methodology for identifying contributions to transmission constraints and assigning relief obligations across the Western Interconnection. FERC staff has identified this initiative as a major Western seams-coordination effort¹⁵ because reliability and congestion management impacts cross market and non-market areas.

E. Summary

Collectively, these activities have allowed SPP and CAISO to advance their Western seams coordination work from general identification of seams concerns toward detailed evaluation of key operational, market, transmission, data-coordination, and reliability requirements. The work completed to date reinforces important principles that will guide future coordination as the operators develop the arrangements, practices, procedures and mechanisms described in this report.¹⁶ SPP and CAISO intend to leverage existing reliability practices, coordination forums and ongoing collaboration as the foundation for addressing the issues identified by the Commission in the July 16 Order.

Question 2

Identify specific seams and market coordination issues created by the ongoing development of organized wholesale markets in the West, including (but not limited to):

¹⁵ Federal Energy Regulatory Commission Staff, *Seams Coordination in the Western Interconnection* (Nov. 21, 2025), at p.4.

¹⁶ The SPP and CAISO seams principles are published on their websites at (SPP) <https://southwestpowerpool.s3.amazonaws.com/newsstories/Markets-Fact-Sheet-SPPs-Seams-Principles-v5.pdf>; and (CAISO) <https://www.westernenergymarkets.com/documents/principles-for-addressing-western-market-seams.pdf>.

- a. **EDAM and Markets+ have different market rules governing transmission commitment and scheduling, which creates the possibility that both markets could schedule the same transmission capacity in the day-ahead and real-time markets. Explain how CAISO and SPP will resolve potential operational and communication challenges regarding transmission commitment, reservation, and use, given their differing market rules.**
- b. **The West has historically relied on contract path-based processes to mitigate known congestion and reliability issues. Explain how congestion management will work between (1) the three markets (EDAM, Markets+, and SPP's expanded RTO) and (2) the market operators and the bilateral markets.**
- c. **Before coordinated market-to-market mechanics existed in the Eastern RTOs, energy scheduled in one RTO frequently resulted in loop flows between markets with little to no formal acknowledgment of those loop flows. This triggered legal disputes over uncompensated transmission usage and who should pay for the resulting power line wear and grid congestion. While EDAM and Markets+ will use contract paths within and between the markets, loop flows nonetheless remain a concern regardless of the contract path approach of designating transmission capabilities. Explain how CAISO and SPP will manage loop flow issues between the markets.**

Response

SPP and CAISO have responded to each of the questions based on their respective approved market designs, explaining how the approved market designs support reliability, fairness, and efficiency, while identifying gaps where additional opportunities for improvement and coordination may exist. Commitment to many of the identified improvements are set forth in response to Question 3, while others are identified for future consideration as markets in the West continue to be developed.

Question 2(a) – EDAM and Markets+ have different market rules governing transmission commitment and scheduling, which creates the possibility that both markets could schedule the same transmission capacity in the day-ahead and real-time markets. Explain how CAISO and SPP will resolve potential operational and communication challenges regarding transmission commitment, reservation, and use, given their differing market rules.

Response

CAISO's EDAM and SPP's Markets+ perform security-constrained unit commitment and dispatch, while Transmission Service Providers and Balancing Authorities retain OATT administration and reliability responsibilities.¹⁷ The underlying framework for transmission reservation and physical scheduling that Markets+ and EDAM builds upon provide an important common foundation which will ensure transmission schedules match reserved transmission service and are accounted for and settled

¹⁷ This report does not distinguish transmission service on the CAISO controlled grid pursuant to the CAISO tariff from more traditional OATT transmission service, even though CAISO transmission service is not based upon an OATT framework and may raise additional considerations in the context of EDAM and WEIM within the market area operated by CAISO.

appropriately in both markets. Transmission service continues to be procured, reserved, confirmed, and administered under those tariffs, and the physical use of transmission service remains subject to the applicable scheduling requirements. These transmission availability frameworks collectively support the exercise of transmission rights across market boundaries to meet market and contractual obligations. Accordingly, participation in either day-ahead market does not expand a transmission customer's right or authorize a transmission customer to physically schedule the same transmission service more than once.

Transmission Service Providers may use different methodologies, assumptions, timelines, and operating practices when determining the amount of transmission capability available for market use under the applicable OATT and customer transmission rights. While the processes for determining available transmission service may differ between Transmission Service Providers, once service has been granted, each reservation has defined service characteristics (*i.e.*, level of firmness, source, sink, MW quantity, and period of service). Based on those characteristics, that service grants specific scheduling rights. Those rights will be scheduled, accounted for, and settled according to the applicable Transmission Service Provider tariff and procedures, and also pursuant to the EDAM and Markets+ tariffs. The network models underlying EDAM and Markets+ markets will utilize schedules submitted under approved transmission reservations in the market clearing process, with each respective market having full visibility into the transactions within its footprint.

A. CAISO Administration of Transmission Availability in EDAM and WEIM

Within the CAISO administered market area, CAISO models the transmission network in its full network model. This includes modeling of the transmission topology, transmission facility ratings, system operating limits, reliability operating limits, remedial action schemes, transformer characteristics, associated transmission limits, contract path limits, and other transmission system information that affects market constraints provided by participating Balancing Authorities, Transmission Operators, and EDAM/WEIM Transmission Service Providers. The market optimization considers this modeling of the combined transmission systems, across the day-ahead and real-time market timeframes, in issuing efficient unit commitment and dispatch instructions.

Balancing Authorities participating in EDAM provide updated transmission system information and review applicable transmission constraints prior to the start of the day-ahead market. The day-ahead market establishes the transmission capacity available for the day-ahead market to support efficient energy transfers between balancing areas within EDAM. This approach enables Transmission Service Providers and their transmission customers located within a Balancing Authority Area to maintain their OATT and transmission service offerings, including network integration transmission service and firm point-to-point rights.¹⁸ A similar process occurs in real-time, although Balancing Authorities participating in WEIM only may submit base schedules to represent imports and exports from their Balancing Authority Area.¹⁹ Each Transmission Service Provider

¹⁸ CAISO Tariff, Section 33.18; *Cal. Indep. Sys. Operator Corp.*, 185 FERC ¶ 61,210 (2023) (accepting the EDAM transmission availability framework), at P 307-321; *PacifiCorp* 192 FERC ¶ 61,197 (2025), at P 239-253 (accepting PacifiCorp's OATT changes supporting customers' use of transmission in EDAM).

¹⁹ Base schedules represent the expected output of non-participating resources in the WEIM balancing area, which are not optimized by the market. CAISO Tariff, Section 29.17. EDAM balancing

remains responsible to manage its transmission facilities under stressed system conditions within its Balancing Authority Area, including administration of the associated scheduling priorities under its OATT and coordination with other reliability entities. All WEIM and EDAM Balancing Authorities and Transmission Operators retain their reliability obligations.

The markets CAISO operates utilize the transmission capacity available within each participating Balancing Authority Area subject to transmission limits while respecting customers' rights and base schedules. Transmission capacity across interties between participating Balancing Authority Areas is utilized in the market to support efficient energy and uncertainty product transfers depending on how the underlying transmission rights are scheduled or released.²⁰ A transfer of energy between participating Balancing Authority Areas is modeled by a pair of matching imports and exports from one Balancing Authority Area to another.

A transmission customer can elect how it will use and exercise its reserved firm transmission rights. Those rights can be used for their own purposes through the market by submitting a balanced self-schedule associated with registered transmission service rights into the day-ahead market. Self-schedules submitted before the day-ahead market

areas do not submit base schedules; rather, their day-ahead schedules effectively become their base schedules for the real-time market. CAISO Tariff, Section 33.29.

²⁰ EDAM supports four hourly energy/capacity transfer types: (1) self-scheduled transmission capacity eligible for resource sufficiency, (2) released specific transmission capacity not eligible for resource sufficiency, (3) released generic transmission capacity eligible for resource sufficiency, and (4) released generic transmission capacity not eligible for resource sufficiency. CAISO Business Practice Manual for EDAM, Section 3.1 (May 1, 2026). WEIM supports three energy-only transfer types: (1) base transfer with non-optimized hourly base schedules between EIM BAAs only, (2) static transfers optimized in the fifteen-minute market, and (3) dynamic transfers optimized in the fifteen-minute market and the real-time dispatch. CAISO Business Practice Manual for WEIM, Section 11.1.5 (May 1, 2026).

are assigned a market scheduling priority higher than a self-schedule not associated with registered transmission service, and these transactions will clear ahead of self-schedules not exercising transmission rights and economic bids. The market will not adjust a self-schedule associated with registered transmission rights to accommodate a self-schedule that is not associated with registered transmission rights, maintaining this market scheduling priority.

A transmission customer may elect to proactively release its transmission rights at an intertie between two EDAM participating Balancing Authority Areas for the market to optimize in exchange for the opportunity to receive an allocation of transfer revenues, *i.e.*, revenue from energy price differences between Balancing Authority Areas at the transfer location. A transmission customer that pursues this avenue cannot later self-schedule the transmission it released. A transmission customer may choose neither to release nor self-schedule its transmission rights by the close of the day-ahead market, leaving the transmission rights unscheduled. In this case, the unscheduled transmission capacity will be available to the day-ahead market for optimization.²¹ Under this option, the transmission customer would retain its right to submit later an intra-day self-schedule associated with the exercise of its transmission rights.

For all intra-day self-schedules submitted to CAISO, the real-time market intervals associated with the exercise of firm transmission rights will dispatch generation to

²¹ For transfer rights between participating Balancing Authority Areas, if the rights are registered or defined before the day-ahead market for the purpose of exercising the rights, the transmission customer can reserve rights by not exercising them. These rights remain reserved in the day-ahead market so that the transmission customer can exercise them in the real-time market. For transfer rights that are released before the day-ahead market and are either registered or matched across a transfer location, the transmission customer may not claim these rights in real-time market. However, for any unmatched transfer rights across a transfer location, the EDAM Entities on either side of that transfer location may release them before day-ahead market.

accommodate both the transfer optimized in the day-ahead market and the transmission customer's self-schedule exercising the firm transmission rights submitted after the close of the day-ahead market. In the case the market cannot accommodate both transactions, then the market will afford the transfer equal market scheduling priority with demand in the Balancing Authority Area and notify the applicable Balancing Authority of the associated schedules and the infeasibility. The Balancing Authority would, acting in accordance with applicable tariffs and good utility practice, determine how to resolve the infeasibility through manual redispatch, adjusting the transfer limit, adjusting the transmission customer schedule, or taking any combination of actions or additional actions to resolve the infeasibility and fulfill its Balancing Authority obligations.

Changes in the real-time market would be submitted to CAISO as an adjustment to a day-ahead schedule or a base schedule, depending on whether the Balancing Authority Area is participating in EDAM or only WEIM. The market will take steps to accommodate these schedules, which are exercising the customers' associated firm transmission rights, including dispatch of generation across the EDAM and WEIM market areas. In any event, the change in financial outcomes associated with schedule changes would be allocated by CAISO to each Balancing Authority according to the applicable settlement rules, which would in turn settle with its transmission customers under the suballocation rules within the associated Transmission Service Provider tariff.

The markets CAISO operates include several different forward look-ahead functions that perform dispatch, unit commitment, resource configuration management, and congestion management that respect bilateral transactions in a multi-balancing authority area optimization. The objective of the optimization is to minimize the total cost

of serving energy demand of the entire EDAM and WEIM area respecting intra Balancing Authority Area physical constraints, as well as inter Balancing Authority Area physical inter-tie constraints and scheduling limits. Accordingly, the markets CAISO operates respect the boundaries between Balancing Authority Areas, the responsibilities of the entities that manage them, and the transmission rights that connect them.

EDAM performs non-financially binding market runs starting four days prior to the operating day to provide market participants with advisory information. A reliability based residual unit commitment run is performed after the day-ahead market and ensures that resources with start-up times in excess of the real-time markets look ahead horizon are committed. The WEIM operates using a multi-interval optimization wherein the objective function minimizes total cost over a rolling look ahead horizon with a single interval being financially settled. The fifteen-minute markets look ahead horizon extends up to eighteen fifteen-minute intervals into the future and performs unit commitment. The five-minute balancing market looks ahead between (7 to 13) 5-minute intervals while using the unit commitment determined for the relevant times by the 15-minute market. EDAM and WEIM operation require all pertinent scheduling and forecasting information for each market time horizon from various sources including each participating Balancing Authority Area. These look ahead features, transmission availability, planned outages and other contingency modeling parameters are included in the optimization using all information required from the bilateral market and the latest information available on an event basis. This ensures CAISO has the latest most accurate current state of the system and look ahead scheduling and forecasting information from different sources so that the markets

operate effectively within a multi-Balancing Authority Area environment while respecting the bilateral market.

B. SPP Administration of Transmission Availability in Markets+

Markets+ uses a comparable network-based representation of the transmission system, but distinguishes transmission capability made available for market use from transmission reserved for external obligations. By default, transmission capability of Markets+ Transmission Service Providers (TSP) is available for market optimization unless it is reserved for external use (i.e., opt-out) or otherwise excluded under the TSP's OATT. Markets+ incorporates scheduling limits, identified by Market Transfer Interfaces (MTIs) between participating Balancing Authority Areas (BAA) and Market Opt-In Transfer Interfaces (MOTIs) when a TSP or customer contributes transmission that may traverse non-participating BAAs. Available transmission capability for market use is limited by the most limiting of e-Tag based capacity (associated with transmission service requests and scheduling timelines, BAA/TOP submitted scheduling constraints (identified by MTIs/MOTIs), and physical constraints represented in the network model.

C. Cross-Market Administration of Transmission

The Commission has asked whether different transmission-commitment rules could permit both markets to schedule the same transmission capability. Transmission service approval and scheduling practices will avoid competing calls on the same transmission, ensuring transmission is not sold twice or scheduled twice, and that transactions are represented consistently in both markets. Transmission reservations are approved, confirmed, and administered exclusively under the Transmission Service Provider tariffs. Neither EDAM nor Markets+ creates new transmission rights or expands

physical scheduling authority of transmission customers. Both markets simply incorporate their schedule and rights into market optimization.

Market participants in each market area are required to schedule transactions between or across other market areas in accordance with the requirements applicable to both market area approved tariffs. Each market will continue to enforce the transmission constraints represented within its respective market model, while Transmission Operators and Reliability Coordinators retain their existing responsibilities to assess actual and anticipated flows on the interconnected transmission system. In this and all other cases of scheduled interchange, if the combined schedules and market flows create or contribute to congestion that cannot be resolved within a market's normal clearing process, the applicable Transmission Operators, Balancing Authorities, Reliability Coordinators, and market operators will coordinate operating plans, constraint activation, redispatch, reconfiguration, or curtailment as necessary to preserve reliable operation.

These market designs collectively permit participants in EDAM and Markets+ to exercise their transmission rights across transmission provider systems and across market boundaries to meet market and contractual obligations. Interchange schedules continue to be represented through established scheduling, interchange or e-Tagging processes, providing information regarding the source and sink Balancing Authority Areas, transmission service supporting the transaction, and applicable scheduling priority.²² These existing mechanisms provide a common operational record of physical interchange even where the underlying market constructs differ. In addition, each Transmission Operator also remains responsible for performing required operational

²² The markets CAISO operates reference submitted schedules rather than submitted e-Tags for these purposes.

planning analyses and coordinating with neighboring Transmission Operators and its Reliability Coordinator where anticipated operating conditions could exceed a System Operating Limit.

D. Cost and Efficiency Considerations

Day-ahead market outcomes are financially binding, but they do not override or eliminate the transmission customer's rights and obligations under the applicable OATT or guarantee that the corresponding day-ahead quantity will remain the physical interchange schedule in real time. A transmission customer may adjust its use of transmission consistent with the applicable tariff and scheduling timeline. Transmission outages, derates, exercise of reserved transmission rights, or other operational changes may change the physical capability previously assumed available to either market or between markets. Both operators acknowledge that timely and accurate communication of these changes is essential to minimizing divergent assumptions between EDAM and Markets+. There is an opportunity to improve the information relied upon by each market through enhanced data and information sharing, as the parties describe in our response to Question 3.

E. Near-Term and Long-Term Coordination Pathways

Efficiency, equity, and reliability can be improved through transparent and compatible rules that enable market participants and operators to understand when interchange will be honored or curtailed, and comparable transactions receive comparable treatment consistent with respective market designs. SPP and CAISO plan to strengthen coordination in several areas. First, improving the frequency, granularity, timeliness, and quality of transmission or transfer capability, outage notifications, and

modifications to scheduled interchange. Second, improving alignment and consistency in modeling common transmission facilities and interfaces. Third, providing education and training on the requirements for scheduling between the market areas.

CAISO and SPP recognize that these identified coordination mechanisms may need to evolve as both markets gain operational experience. The parties will therefore continue to evaluate enhancements that reduce unnecessary barriers to efficient interchange while preserving the transmission rights established under the applicable transmission service provider tariffs and approved market designs. Current practices, procedures and approved market designs will apply until further enhancements are evaluated, developed, and adopted.

Question 2(b) – The West has historically relied on contract path-based processes to mitigate known congestion and reliability issues. Explain how congestion management will work between (1) the three markets (EDAM, Markets+, and SPP's expanded RTO) and (2) the market operators and the bilateral markets.

Response

Historically, congestion in the Western Interconnection outside of the CAISO Balancing Authority Area has been managed primarily through tariff-based scheduling priorities, path ratings, and curtailment protocols. Balancing Authorities, Transmission Service Providers, and Transmission Operators retain their reliability and service obligations under both EDAM, WEIM and Markets+ market designs. Congestion management in the Western Interconnection will continue to rely on a combination of existing transmission and reliability processes. The market-based congestion management mechanisms in EDAM and Markets+ supplement, rather than replace, the

contract-path curtailment protocols that have long governed reliability across the West outside of the CAISO and SPP RTO West Balancing Authority Areas. The implementation of the Western Interconnection Loading Relief (WLR) process, as described in response to Question No. 3, moves regional congestion management toward a more effective flow-based methodology. Contract-path scheduling and OATT transmission rights will remain in place for the foreseeable future, while the organized markets will use flow-based network models and security-constrained dispatch to manage congestion within their respective footprints.²³

Within the market clearing process, flowgates represent limits on transmission facilities throughout the market footprint, with flowgate enforcement determined by each Balancing Authority and Transmission Operator. Within each market, congestion will generally be managed through that market's normal commitment and dispatch processes. In some cases, a constraint in one market may be materially affected by parallel loop flow from an external market or non-market region. To address these situations, SPP and CAISO are working with Balancing Authorities, Transmission Operators and Transmission Service Providers to develop a process whereby jointly impacted constraints can be proactively identified, relevant model and operating-limit information aligned, and relief obligations determined and implemented.

SPP and CAISO actively engage in seams considerations associated with non-market areas. However, congestion involving seams with non-market areas will rely exclusively on coordination among Transmission Operators, Balancing Authorities, and

²³ FERC staff has similarly recognized that Western scheduling remains largely contract-path based even as organized markets increasingly rely on flow-based modeling to evaluate actual system impacts. Federal Energy Regulatory Commission Staff, *Seams Coordination in the Western Interconnection* (Nov. 21, 2025), at p.17.

Reliability Coordinators. This includes the WLR which will treat both non-market and market entities equitably based on the firmness of the transmission service associated with activation of the process. Depending on system conditions, relief may include redispatch, transmission reconfiguration, interchange adjustments, or curtailment. Market operators could implement the relief assigned to their market areas as a constraint on market flows if there is agreement among the impacted Balancing Authorities and Transmission Operators, while non-market entities would continue to act through their existing operating procedures.

A. CAISO Congestion Management

CAISO conducts advisory day-ahead market runs beginning four days prior to the operating day (D+4), in part, to assess and identify congestion in the study period. In developing the market model, CAISO either forecasts or receives load forecasts for all Balancing Authority Areas across the Western Interconnection. Using submitted generation schedules combined with historical observations and established heuristics, CAISO develops a set of modeled injections to balance forecast demand in non-market Balancing Authority Areas. These injections also reflect expected net scheduled interchange between Balancing Authorities. For advisory market runs, CAISO uses supply offers submitted up to seven days in advance or substitutes offers from comparable historical days when necessary. All transmission outages available through RC West are incorporated into the advisory runs.

CAISO utilizes market constraints to reflect contractual flow limits within its market processes. These include legacy rights of non-market participants as well as the rights of market participants. Similar to physical constraints, the use of a market constraint to honor these rights ensures the security constrained unit commitment and economic

dispatch process appropriately schedules around these contractual rights. The calculation of the cost of respecting these rights is included within the markets nodally calculated congestion price.

CAISO activates a subset of all potential physical constraints to reflect expected system conditions under which contingency impacts are likely to become operationally significant. Following each advisory day-ahead market run, CAISO uses the results of these cases to perform an offline analysis that evaluates only the active subset of contingency constraints, the offline analysis evaluates all contingency constraints defined within the footprint of the markets CAISO operates. This iterative process helps ensure that the appropriate contingency constraints are activated in future market runs, thereby supporting both system reliability and accurate congestion management.

In the real-time market, the CAISO Balancing Authority, as well as WEIM participating Balancing Authority Areas, can compare market flow results against outputs from real-time contingency analysis tools. These tools rely on state-estimator solutions derived from telemetered system data and may capture operating conditions that are not fully represented in the real-time market model. When discrepancies arise between market flows and observed power flows due to data quality issues, model differences, or market timing limitations, system operators may take proactive actions to maintain reliability and improve congestion management accuracy. Such actions may include activating additional contingency constraints, modifying flowgate limits, or making other model adjustments to better align market outcomes with actual system conditions.

B. SPP Congestion Management

SPP uses similar security-constrained unit commitment and dispatch processes in both Markets+ and its expanded RTO footprint in the Western Interconnection. Within SPP's expanded RTO, SPP incorporates transmission constraints affecting the RTO footprint directly into the market optimization and redispatches internal resources to maintain secure flows. When an external system element's outage or overload could cause excessive loading on a monitored transmission element within the RTO West footprint, SPP models the internal monitored element as a market constraint and coordinates with the neighboring Transmission Operator and Reliability Coordinator to address the external contingency that contributes to the potential violation.

Markets+ incorporates physical transmission constraints – such as System Operating Limits (SOL), Interconnection Reliability Operating Limits (IROL), Remedial Action Scheme (RAS) triggers – and market-relevant scheduling constraints such as Service Flow Constraints, Market Transfer Interface, Market Opt-In Transfer Interface, and BAA Scheduling Constraints. These market-relevant constraints reflect the amount of transmission capability made available to the market versus capability reserved for external obligation under the relevant OATTs. Markets+ uses security-constrained optimization process to commit and redispatch generation around both categories of constraints. Similar to EDAM, Markets+ supplements the market redispatch with the established reliability tools when market redispatch is insufficient to resolve the condition.

Markets+ supplements the market redispatch with the established reliability tools when market redispatch is insufficient to resolve the condition.

C. Congestion Management of External Flows

Congestion at market seams, internal to either market footprint and between market and non-market areas, can arise in several ways: from differences in day-ahead flow assumptions across EDAM, Markets+, and SPP's RTO, from parallel flows originating in non-market areas, or from contract-path bilateral transactions whose physical impacts diverge from their scheduled paths. The West will contain day-ahead market participants, real-time-only market participants, and non-market systems for the foreseeable future. In all these scenarios, coordination between market operators is essential because no market or grid operator has full operational control across the entire Western Interconnection.

Through reliability-based actions taken by Transmission Operators or Balancing Authorities, for example using the WLR process, congestion caused by external transactions are directly addressed. The developing WLR framework that expands the use of the ECC is expected to strengthen this coordination by providing a more standardized, flow-based method for identifying contributions to constrained facilities and assigning relief obligations across both market and non-market areas while respecting transmission-service priority. SPP RC and RC West have jointly supported expansion of the ECC for this purpose.

D. Costs and Efficiency Considerations

Congestion management costs incurred within a market footprint to relieve flows caused by external transactions are generally borne by the market's participants. This may occur when market redispatch is needed to offset unscheduled flows or flows originating outside the market footprint. CAISO and SPP recognize that equitable cost

allocation will remain an important discussion point as Western markets mature, particularly if parallel flows regularly contribute to redispatch costs on market participants.

While market dispatch within each footprint provides least-cost internal congestion management, the West does not yet have a mechanism for coordinated least-cost redispatch across multiple organized markets. If mutually binding or impactful constraints occur, one market may redispatch higher cost resources while a lower cost redispatch option existed across the boundary in another market. CAISO and SPP acknowledge that coordinated market-to-market redispatch – like mechanisms used in the Eastern Interconnection – may improve both efficiency and reliability but implementing such a system in the West will require substantial work. The presence of multiple, independent Transmission Service Providers, Balancing Authorities and non-market load, as well as contract-path scheduling for bilateral transactions, will necessitate a staged, carefully coordinated approach to seams management.

Bilateral congestion-management mechanisms remain essential in cases where non-market areas contribute materially to the constrained facility. The operation of EDAM and Markets+ does not displace the authority of Transmission Operators, Balancing Authorities, or Reliability Coordinators and those entities also have tools available to manage congestion. Each market will model and manage internal constraints, while the operator of an affected external facility may communicate an operating limit, request relief, curtail schedules under the applicable tariff, or use Western Unscheduled-flow Mitigation process or emergency procedures.

E. Near-Term and Long-Term Coordination Pathways

Near term, CAISO and SPP will work together on enhanced coordination through the WLR process, aligned modeling practices, and improved visibility into transmission outages, derates, and operational limits. The operators plan to develop a framework for managing jointly impacted constraints and refine process for aligning network models for common transmission facilities.

Over the longer-term, SPP and CAISO expect to evaluate whether more formal market-to-market congestion management mechanisms could be developed. Any such framework would require harmonized modeling practices, flow-attribution, relief obligations, and settlement mechanisms capable of compensating redispatch from either market when appropriate. SPP and CAISO appreciate that Western implementation will need to account for non-market Balancing Authority Areas and bilateral schedules in way the Eastern arrangements did not, requiring tailored approaches rather than a direct use of Eastern market-to-market mechanisms. This approach preserves the West's existing transmission framework while improving coordination based on the actual physical impacts of market and bilateral flows.

Question 2(c) – Before coordinated market-to-market mechanics existed in the Eastern RTOs, energy scheduled in one RTO frequently resulted in loop flows between markets with little to no formal acknowledgment of those loop flows. This triggered legal disputes over uncompensated transmission usage and who should pay for the resulting power line wear and grid congestion. While EDAM and Markets+ will use contract paths within and between the markets, loop flows nonetheless remain a concern regardless of the contract path approach of

designating transmission capabilities. Explain how CAISO and SPP will manage loop flow issues between the markets.

Response

SPP and CAISO recognize that loop flow is an inherent feature of the Western Interconnection and that day-ahead and real-time market operations in EDAM and Markets+ will influence physical flow patterns. Although both markets take steps to identify transmission capability available to the market for optimization, physical flows will diverge from scheduled paths and physical flow assumptions, and both market operators must ensure that loop flows from market and non-market areas are managed reliably and consistently across seams.

In the near term, loop flows will be managed using existing congestion management processes the parties describe in response to Question 2(b), including existing Transmission Operator and Reliability Coordinator processes. Those processes include operational planning studies, coordinated operating plans, transmission reconfiguration, constraint activation, redispatch, and, when necessary, curtailment of tagged schedules consistent with the applicable Transmission Service Provider tariffs and established curtailment procedures. Within each organized market, the market operator will use economic redispatch to reduce the market's contribution to a constrained facility where appropriate. Collectively these processes preserve the ability to maintain system operating limits.

A. Costs and Efficiency Considerations

Although the current processes and near-term enhancements allow for reliable loop flow management, CAISO and SPP acknowledge that equitable attribution and

allocation of redispatch cost for loop flows remains an open issue across the Western Interconnection. This important equity issue must be evaluated as operating and market experience is gained, but that economic-equity issue does not mean loop flow cannot be managed reliably using the tools described above. As operational experience develops, the market operators will evaluate methods for more accurate flow attribution and consider whether additional settlement or coordination mechanisms are appropriate, recognizing that any such framework would need to account for and accommodate the West's multi-Transmission Service Provider and multi-Balancing Authority environment and significant bilateral activity.

B. Near-Term and Long-Term Coordination Pathways

SPP and CAISO intend to improve the identification and assignment of loop-flow impacts through the developing WLR process. The expanded ECC is intended to provide a standardized, flow-based methodology for identifying which market and non-market areas are contributing to a constrained facility and assigning relief obligations based on those physical impacts while respecting applicable transmission-service priorities.

In addition, SPP and CAISO will develop a framework for identifying jointly impacted constraints and enhance data sharing to improve the frequency, granularity, timeliness, and quality of shared information related to outage, derate, transfer, and operating-limit information. This will allow the two market operators to better recognize when dispatch in one market is materially affecting facilities monitored by the other and to coordinate the resulting relief through their respective market processes.

Question 3

Submit a plan and schedule for addressing each of the issues in question (2) based upon the relative prioritization of those issues for both importance and timing. Describe (1) the basis for that prioritization and (2) where the protocols or procedures governing each issue will be located (e.g., manuals, a potential joint operating agreement between CAISO and SPP, bilateral agreements with specific market participants or adjoining BAAs, etc.). Where CAISO and SPP anticipate making a filing with the Commission to address an issue, the report should include an anticipated timeline for submitting the relevant filing.

Response

CAISO and SPP propose a coordinated plan and schedule in this report that reflects shared prioritization. The objective is to ensure that both market operators can consistently identify shared transmission impacts, exchange the information needed to evaluate those impacts, and implement procedures to effectively and fairly allocate grid management responsibility. This means that the parties have prioritized workstreams that directly support operational reliability ahead of efforts related to financial market-to-market redispatch and financial settlement. SPP and CAISO agree that modeling, flow-attribution, and operating procedures must be established and validated through operating experience before considering market-to-market optimization or settlement.

The governing framework for seams coordination is intentionally layered rather than contained in a single document. Reliability Coordinator and Transmission Operator responsibilities will continue to reside in operating plans and reliability procedures, some of which are governed by regional standards such as IRO-10 and the Western

Interconnection Modeling and Monitoring Common Methodology. Market specific implementation details will continue to reside in the Markets+ Protocols and CAISO business practices. Broader coordination between CAISO and SPP may be documented in a seams coordination agreement. Bilateral arrangements may also be appropriate where specific neighboring Balancing Authorities or Transmission Service Providers have unique operational or customer-related requirements that differ from regional norms.

To support this framework, CAISO and SPP intend to negotiate and file a seams coordination agreement that memorializes their shared objectives to the extent these objectives are not otherwise be reflected in another procedure, ongoing practice, process, or agreement that may already exist or may be developed separately. The parties seams coordination agreement will be limited to the near-term objectives identified in this report and will necessarily be a living document. Because some issues identified in this report may not be addressed prior to the Markets+ implementation, the initial coordination agreement will primarily serve to memorialize the parties' commitment to the near-term objectives and workstreams identified in this report. CAISO and SPP intend to submit this agreement to the Commission for an effective date of October 1, 2027, unless circumstances warrant a later filing. If anything arises that delays submission of, or supersedes the need for, a seams coordination agreement, SPP and CAISO will notify the Commission of the revised timeframe and the reason for the delay through an addendum to this report. Regardless of the filing schedule, the parties will continue pursuing implementation of the shared objectives identified in this report.

The seams coordination efforts outlined in this framework are those that SPP and CAISO can reasonably work toward and likely implement prior to or shortly after Markets+

begins operation on October 1, 2027. The parties have identified five areas where seams coordination can be enhanced in this timeframe, along with a commitment to develop a longer-term plan for additional coordination beyond the operation of Markets+. Attachment A includes a table summarizing these workstreams.

A. Education and training

The first, and ongoing, workstream is to enhance education and training on market protocols. Each market operator already provides training on import and export scheduling within its own footprint.²⁴ CAISO and SPP recognize that a common understanding of the mechanisms required to navigate multiple market footprints is essential for trading between markets and between market and non-market areas. To support this, CAISO and SPP will collaborate and develop educational materials²⁵ and training sessions. These efforts began during the joint seams workshops and will continue throughout market design evolution, implementation, and any subsequent expansions. SPP and CAISO consider this workstream a top priority because understanding of seams coordination based on the approved market designs is essential to effective and reliable operations.

B. Data exchange

The second workstream focuses on enhancing data exchange. Today CAISO, SPP, and their participating Balancing Authorities and Transmission Operators already

²⁴ CAISO computer based training and other materials regarding EDAM and WEIM are available on the Western Energy Markets website at <https://www.westernenergymarkets.com/resources>. SPP stakeholder training can be found at <https://www.spp.org/stakeholder-center/stakeholder-training/spp-learning-center/>.

²⁵ For example, SPP and CAISO are working on a glossary of terms for Markets+ and EDAM to establish a common understanding of terminology.

exchange significant operational under the Western Interconnection Data Sharing Agreement (WIDSA) developed by CAISO and other parties in 2019 to update and standardize the approach to data sharing across the West. The data sharing that occurs under the WIDSA supports various system operations and procedures such as the IRO-010 – Reliability Coordinator Data Specification and Collection. However, seams coordination are actively being identified, and system investments may be required across multiple entities. Additional data sharing occurs under a variety of standards and procedures.

SPP and CAISO plan to enhance data exchange by working to improve the frequency, granularity, timeliness, and quality of shared information. Enhancements to data exchange will be implemented progressively through 2027.

C. Model alignment

The third workstream is the continued maintenance of the full network model and common mapping standards. The Western Interconnection network model spans hundreds of thousands of transmission elements across multiple Balancing Authorities, states, provinces, and market structures, the model represents a highly interconnected system with significant transfers of energy, diverse resource portfolios, and rapidly evolving renewable generation. Entities in the West have invested extensively in developing, maintaining, and validating a high-quality network model, combining rigorous data governance and close coordination with Transmission Operators and planning entities. Continuous enhancements and regular releases reflect changing system conditions. The resulting model is a regionally significant asset that supports reliability assessments, transmission planning, interconnection studies, and market operations.

Today and increasingly into the future, Reliability Coordinators and market operators will reference and share data on elements of the bulk electric system with speed and precision. This exchange will be supported by model alignment and mapping standards. For example, the Reliability Coordinators in the Western Interconnection entered a memorandum of understanding regarding shared tools in 2019. This understanding builds on the WIDSA as the basis for data sharing and establishes a framework for sharing, administering, and sustaining tools and data for the Western Interconnection. CAISO, SPP and others have successfully used this framework to develop the Enhanced Curtailment Calculator (ECC), as well as to sustain the WECC Interchange Tool (WIT), and we will continue to leverage these underlying arrangements to facilitate identified enhancements.

The memorandum of understanding also establishes an RC Executive Committee, including CAISO, SPP and other Reliability Coordinators in the Western Interconnection as members. The RC Executive Committee meets regularly to identify needs and opportunities for further alignment and cooperation on tools and data. Anticipating the need for coordination at seams, over the past year the associated modeling staff has discussed further coordination improvements needed for the Western Interconnection modeling process.

CAISO, SPP, and other RCs in the west already maintain a shared methodology under the IRO-002-7 WECC regional variance. CAISO, SPP and the other Reliability Coordinators in the West published the first Western Interconnection Modeling and Monitoring Common Methodology in 2019, and the members of the RC Executive

Committee have since collaborated to produce annual updates.²⁶ This methodology includes a method for development, maintenance, and periodic review of a Western Interconnection Reference Model to serve as the baseline from which Reliability Coordinator's operational models are derived. Further updates, in particular those scheduled for 2027, will include the refinements to the scope of modeled facilities, use of persistent identifiers, data structures, data resolution, and update frequencies.

CAISO, SPP and other Reliability Coordinators in the Western Interconnection have agreed to build on the network model as a foundational regional asset in a way that facilitates ongoing communication and data sharing. This cooperation will enable consistent and transparent analysis across the Western Interconnection. Alignment in this area reduces duplication of effort and improves quality of decision-making for regulators, planners, operators, market participants, and other stakeholders. The current and to be improved common model for the Western Interconnection plays a pivotal role in helping Reliability Coordinators develop a wide area accurate model for operational planning studies and real time reliability coordination studies. Accurate model alignment helps identify reliability issues and manage these issues in a coordination manner. CAISO and SPP will also explore whether a common flow methodology could help avoid inconsistent calculation of shift-factors, modeling of generation or load, or interchange assumptions that may create artificial congestion or fail to recognize actual congestion impacts. These efforts will continue through adoption and deployment of an improved network model and associated mapping standards.

²⁶ The Western Interconnection Modeling and Monitoring Common Methodology published by CAISO is available at <https://www.caiso.com/documents/rc0600a.pdf>.

SPP and CAISO are committed to maintaining full network model alignment and a common mapping standard. This workstream is active and ongoing.

D. Western Interconnection Loading Relief process

The fourth workstream concerns implementation of the Western Interconnection Loading Relief (WLR) and the Enhanced Curtailment Calculator (ECC). CAISO (through RC West) and SPP through the ECCWG (Enhanced Curtailment Calculator Working Group) along with the other Western Interconnection Reliability Coordinators are developing the changes to the existing ECC. The existing ECC tool is utilized for Unscheduled Flow Mitigation Process (UFMP) that encompasses 5 paths across the Western Interconnect to manage parallel flows. These new changes will enable reliability coordinators to utilize the ECC for managing parallel flows across any transmission facilities in the Western Interconnection. This new process is being called the Western Interconnection Loading Relief (WLR) process. CAISO, SPP and others collaborated on a NAESB standard establishing the WLR process and methodology that was approved by NAESB on December 2, 2025, and has been added to WEQ-008 Transmission Loading Relief business practices. This will be utilized by the Reliability Coordinators and Transmission Operators as one of the tools in the Western Interconnection, along with the associated operating procedures, for unscheduled flow mitigation and market congestion management. RC West, SPP RC and British Columbia RC are currently working with the vendor to implement this standard into the ECC. NAESB is planning to file the updated WEQ-008 BPS with the Commission in Q4 of 2026. Adoption of this standard by the Commission will enable CAISO and SPP to coordinate application of the new standard in their work with transmission providers and manage unscheduled flow.

The WLR process is a Reliability Coordinator led effort that will enable flow-based constraint management for all transmission facilities across the Western Interconnection. This process will utilize RC West's full network model of the Western Interconnection. Reliability coordinators in the West will jointly oversee WLR development into ECC through the Enhanced Curtailment Calculator Working Group (ECCWG), which reports to the RC Executive Committee. RC West (CAISO), SPP RC, BPA, Western Area Power Administration, Tri-State Generation and Transmission Association, Inc., and other Western entities participate in this governance structure. The WLR process represents a significant opportunity to manage parallel flows across any System Operating Limit. CAISO and SPP will collaborate and coordinate with the Balancing Authorities and Transmission Operators within their respective Reliability Coordinator service areas to improve the opportunity for their respective markets to facilitate implementation of the WLR process. This will require further outreach, education and consensus for market application to the individual Balancing Authorities and Transmission Operators in the Western Interconnection who remain responsible for the associated System Operating Limits for their facilities.

SPP and CAISO are committed to the implementation of the Western Interconnection Loading Relief process and Enhanced Curtailment Calculator through the applicable NAESB process. NAESB plans to file the updated WEQ 008 business practices with the Commission in the fourth quarter of 2026, and expanded ECC/WLR capability is targeted for completion by the end of 2027.

E. Framework for jointly impacted constraint management

The fifth workstream addresses jointly impacted constraint management across both real-time and day-ahead timeframes. Existing operating procedures have supported effective coordination at the TOP-TOP and RC-RC seams by addressing transmission constraints jointly and equitably. Most of the operating procedures have enabled real-time constraint management where Reliability Coordinators and Transmission Operators work together to address the System Operating Limit exceedances in real-time. Some of the real time mitigations include through transmission reconfiguration, phase shifter optimization, and market-based solutions. If the market mitigations are not providing the required relief, there are steps for shared manual redispatch of generation to resolve the operational issues.

As new day-ahead markets emerge across the Western Interconnection – including EDAM and Markets+ –additional coordination is needed to jointly manage the transmission constraints that are materially affected by multiple markets' dispatch. CAISO and SPP, working with Transmission Operators, Transmission Service Providers, and Balancing Authorities, will develop a framework to identify constraints materially affected by multiple markets, determine relief obligations, and provide the agreed relief through the markets. This framework is targeted for adoption; *i.e.*, completion of the framework but not complete implementation of that framework, by the end of 2027.

F. Plan for longer-term market-to-market enhancements

Finally, CAISO and SPP recognize that seams coordination will continue to evolve beyond implementation of the workstreams identified in this report. For this reason, SPP and CAISO commit to develop and publish a longer-term plan that evaluates opportunities

for further enhancements to seams coordination. These efforts will proceed after the foundational reliability enhancing workstreams described above are established and operational experience is available.

Question 4

Identify any areas in which the market operators are not yet aligned on a path forward.

Response

SPP and CAISO are aligned on the objectives identified above. The parties also appreciate that additional efforts may be appropriate, and are committed to a collaborative focus on further seams and market coordination considerations. The parties have nonetheless identified some areas of uncertainty that will need consideration as they move forward. For example, SPP and CAISO have not finalized the governance structure for seams coordination, including where each of the obligations should reside once finalized; e.g., in tariffs, market protocols, Reliability Coordinator or Transmission Operator procedures, bilateral arrangements, or the broader CAISO-SPP seams coordination agreement. Seams coordination governance and other implementation considerations will require further engagement among CAISO, SPP, Balancing Authorities, Transmission Operators, Transmission Service Providers and other interested entities, customers and stakeholders in the West. The parties are committed to resolving these open questions.

IV. CONCLUSION

CAISO and SPP respectfully request the Commission accept this Joint Report as responsive to the Commission's questions in the July 16 Order.

Respectfully submitted,

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Dated: September 30, 2026

Attachment A: Summary of Objectives²⁷

The following table summarizes the near-term objectives described above that the parties have committed to pursue and implement in this report. Additional seams coordination measures, some of which are also described above, will be further considered and appropriately reflected in a longer-term plan that the parties will develop.

Priority	Plan	Schedule	Location
Education and training on market protocols	Establish a common understanding of the mechanisms required to navigate multiple market footprints.	Initiated through joint Market Seams Workshops, individual Market Operator training of market participants, and through additional joint educational efforts.	SPP and CAISO market training materials, additional material for workshops and other educational forums.
Data exchange	Enhance data exchange by working to improve the frequency, granularity, timeliness, and quality of shared information, including outages, derates, phase-shifter schedules, and transfers.	Implement progressively through 2027.	Data-sharing arrangements, RC/TOP operating plans, and market operating mechanisms.
Model alignment	Maintain enhanced full-network-model alignment and a common mapping standard.	Continuously maintain enhanced network model as markets expand.	RC modeling standards, as reflected in IRO-002 WECC Regional Variance and related arrangements.
WLR process implementation	Support standardized, flow-based identification of contributions and assignment of reliability relief across market and non-market areas.	Continue development through the applicable NAESB process, with implementation targeted for end of 2027.	NAESB standards, Western reliability procedures, and associated RC and TOP operating practices.

Priority	Plan	Schedule	Location
Jointly impacted constraint management	Develop a framework, in coordination with BA/TOP/TSPs, to identify constraints materially affected by multiple markets, determine relief obligations, and provide the agreed relief through the markets.	Framework targeted for adoption by the end of 2027.	RC/TOP operating procedures, joint operating plans, as may be supplemented by applicable market protocols and coordination agreements.
Plan for longer-term market-to-market enhancements	Develop and publish a longer-term plan that evaluates opportunities for further enhancements to seams coordination after foundational reliability processes are established and operational experience is available.	Subsequent phase following implementation of the near-term work described above.	Potential future seams coordination agreement amendment, supporting tariff provisions, protocols, practices, or procedures.